



National Institute of Food and Agriculture

U.S. DEPARTMENT OF AGRICULTURE

BIOENERGY, CLIMATE, AND ENVIRONMENT
FOOD PRODUCTION AND SUSTAINABILITY
YOUTH, FAMILY, AND COMMUNITY
FOOD SAFETY AND NUTRITION
INTERNATIONAL PROGRAMS

NIFA

The Regional Feedstock Partnership

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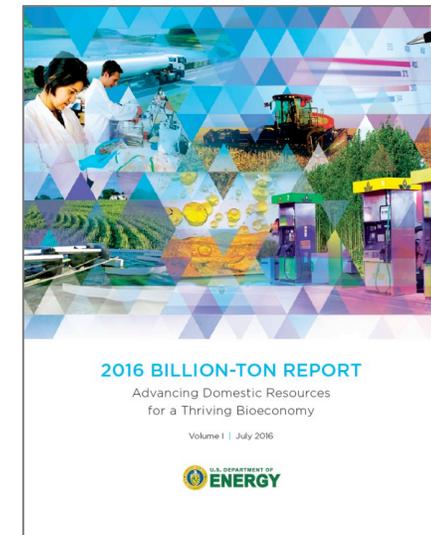
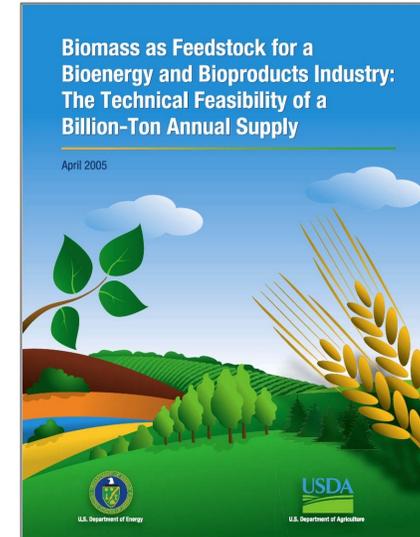
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Partnership Overview

- Billion Ton Study released in 2005
- Sun Grant Regional Biomass Feedstock Workshops
 - 2006 SE, NC
 - 2007 W, SC, & NE
 - Regional evaluation of Billion-ton study
 - Identified major feedstocks and projected potential sustainable supply within regions
- Sun Grant/DOE Regional Biomass Feedstock Partnership formed in 2007
- Field trials initiated in 2008 including participants from LGUs, USDA ARS, DOE, National Labs, industry
- Total funding:
 - > \$20 Million from DOE
 - Around \$5 Million in cost share



Identified Near-Term Biomass Feedstocks (plus people to implement field trials)

- Herbaceous

- Corn residue
- Cereal crop residues (primarily wheat straw)
- Switchgrass
- Miscanthus x giganteus
- Sorghum (sweet, high biomass, forage)
- Energycane
- Cool & warm season grass mixtures (CRP)

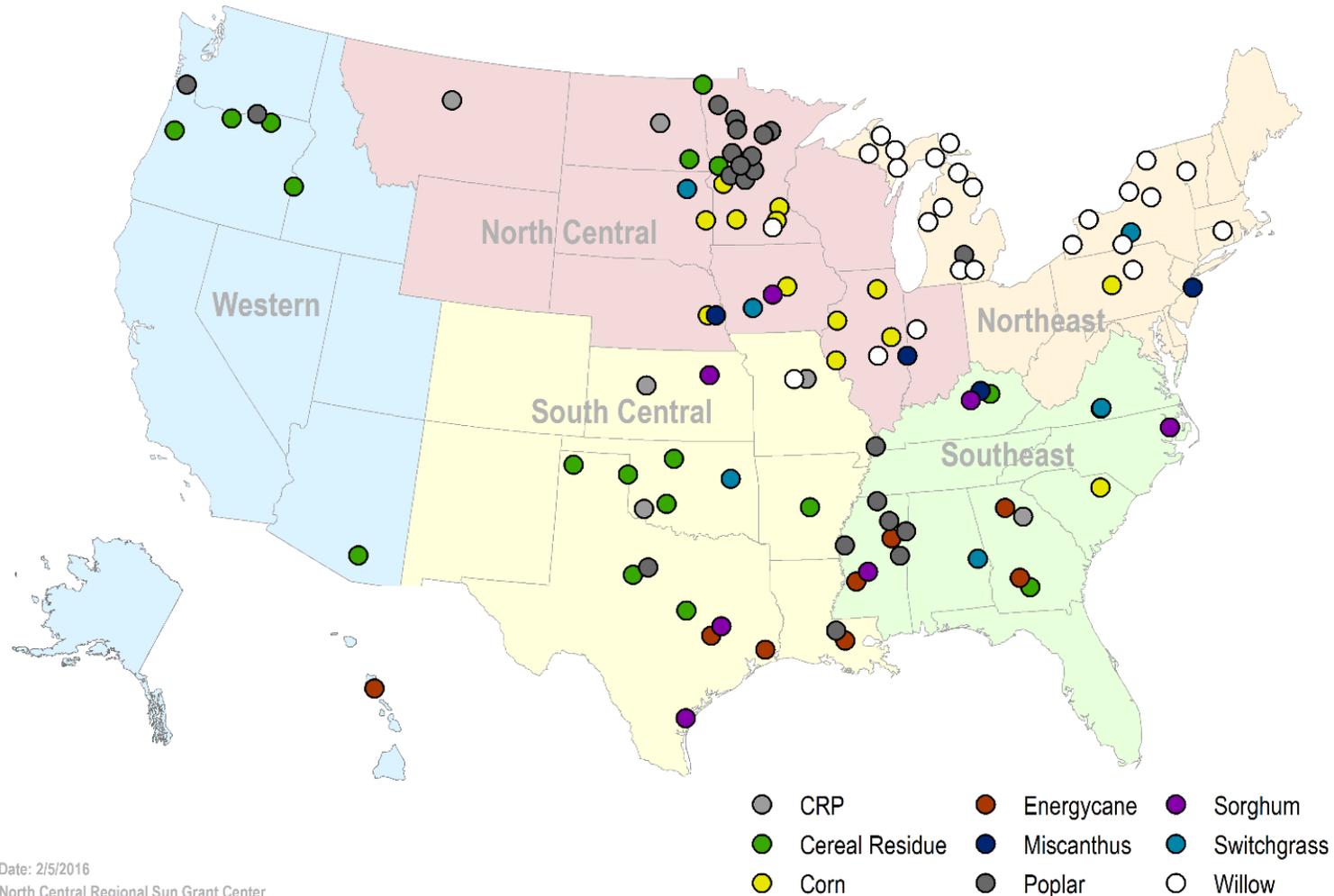


- Woody

- Short rotation poplar
- Short rotation willow



RFP Field Trial Locations across the US beginning as early as 2008



Regional Feedstock Partnership Pls, Years, and Sites

	Totals	Corn Stover	Corn Stover Computer Model	Cereal Residues	Sorghum	Switchgrass	Miscanthus	Energycane	CRP Mixed Grasses	Poplar	Willow	GIS	SGA Advisors + Ilioco	USDA ARS Advisors
Total # Pls	81	16	6	1	7	6	5	8	7	5	5	5	5	5
Total # sites	141	21			7	6	5	8	7	65	22			
Years/site		5			5	8	8	8	6	7	7			
Sites x Years	943	105			35	48	40	64	42	455	154			

A Few Project Impacts

- Ground-truthing crop yields across wide geography to underpin the *2005 Billion-Ton Study* and contributing to the *2016 Billion Ton Report*
- Yield stability across geography and time (5-7 years)
- Stand persistence (perennials)
- Responses to severe drought (e.g., 2012)
- Responses to fertilization
- Cold tolerance limits for energycane
- Sustainability measurements (SOM, POM, GHG, net energy balance)
- Feedstock economics
- Significant yield gains for willow and poplar
- National yield potential maps

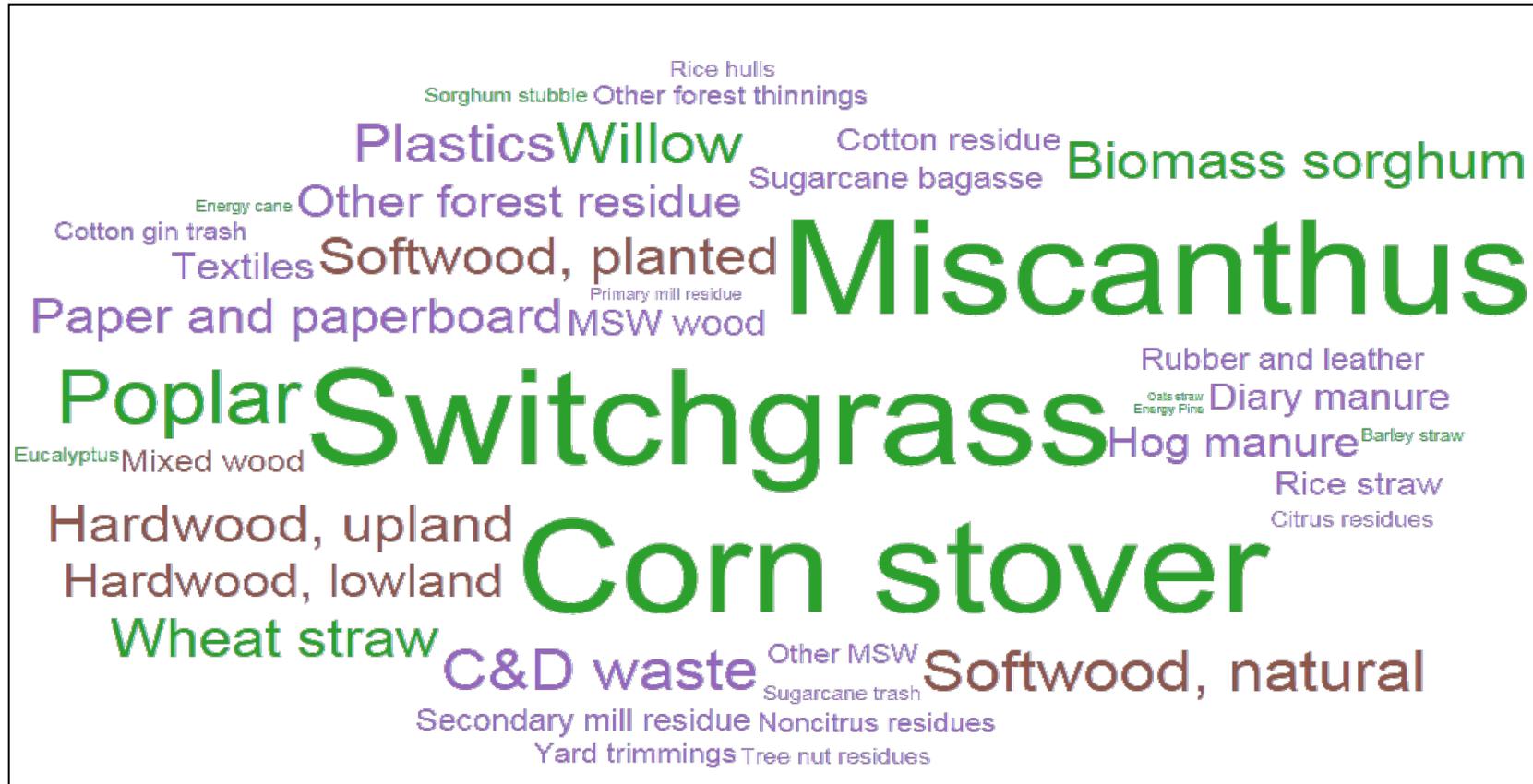


Outreach

- Producer interactions
- Field days
- BioWeb (<http://bioweb.sungrant.org/>)
- Southeast Biomass Atlas (<http://biomassatlas.org/>)
- Publications
- National Conferences



RFP data fed into 2016 Billion Ton Report -Major biomass sources, 2040



Base case scenario, 2040, \$60 per dry ton or less

Contributed samples to INL for chemical characterization; now in the Bioenergy Feedstock Library

Feedstock	# Samples
CRP Mixed Grasses	540
Switchgrass	1280
<i>Miscanthus</i>	542
Energycane	582
Sorghum	1056
Shrub Willow	367
Hybrid poplar	96
Total	4463

INFORMATION TRANSFER

- **Bioenergy Knowledge Discovery Framework**
 - <https://bioenergykdf.net/sun-grant-initiative>
 - <https://bioenergykdf.net/sun-grant-initiative-crop>
- **Bioenergy Feedstock Library**
 - <https://bioenergylibrary.inl.gov>

From: Emerson et al., INL/EXT-21-63851



Partnership outputs

- 140+ peer-reviewed papers
 - Two special issues in *Bioenergy Research* (one on corn and one from the NOLA conference)
 - *GCB Bioenergy* (Woody-26, Herbaceous-58 plus data, PRISM papers published together)
- 5+ book chapters
- 25+ conference proceeding articles
- 200+ presentations at meetings and conferences
- 50+ extension/outreach publications.
- RFP Summary Report



Challenges

- PI changes
- Funding
 - Sustainability sites limited due to cost
 - Timing with establishing trials
- Data/sample collection, sharing, and publishing
 - What to collect?
 - Basic soil data
 - Metadata
 - Feedstock samples
 - When to share
 - Putting it all together (templates, metadata, etc.)
- Continuing relevant/important efforts post-RFP



Successes and Best Practices

- Billion Ton validation and contribution
- DOE BETO Peer Reviews
- National yield potential maps
- Agronomist/Forester/Modeler team meetings
 - Helped to identify issues
 - Quality check data and ground truth modeling efforts
- RFP annual meetings
 - Coordinating activities
 - Soil data
 - Data availability
- Continued value
 - INL Bioenergy Feedstock Library
 - ORNL KDF
- Longer than normal award period
 - Up to seven years of yield data
 - Drought, floods, frost, establishment
 - Sustainability measurements at some sites
- Publications
- Relationships



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